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Abstract. We present V, I CCD photometry of the Sextans dwarf spheroidal galaxy (dSph) in the Local Group. Images of the galaxy were taken by Suprime-Cam on Subaru, covering 26 fields extended to the tidal radius. The color-magnitude diagrams extending two magnitudes below the main-sequence turnoff (MSTO) show a steep red giant branch (RGB), blue and red horizontal branch (HB), blue stragglers, and main-sequence (MS) stars. From the luminosity difference between the HB and the MSTO, we estimate the ages of the galaxy's stellar populations. We find that the relatively younger stars (∼10Gyr) are more spatially concentrated toward the galaxy center than old stars (∼14Gyr), which indicates that the star formation in the central region continued at least a few Gyr. This is consistent with the different spatial distributions of red and blue HB stars. The long duration of the star-formation period in the central region of the galaxy is possibly related to dissipative gas physics during the epoch of post-reionization evolution, or to the accretion history of satellites.

1. Population Gradient in the Sextans dSph

We observed deep V, I CCD images of 26 fields in the Sextans dSph with Subaru's Suprime-Cam. We obtained the color-magnitude diagram (Figure 1, left), which is deep enough to derive the stellar populations and wide enough to study the spatial distibution of each population. The red HB stars are more concentrated toward the center and the blue HB stars are less concentrated than MS, RGB, BS stars (Figure 1, top right). These differences suggest the existence of multiple stellar populations in the Sextans dSph. This is consistent with the fact that MS, RGB, BS all seem to include the extended population, whereas the red and blue HB stars seem to be the young/metal-rich, old/metal-poor population, respectively.
We derived the stellar age from the center to the outer region of the Sextans dSph. We estimated the luminosity difference of the HB and MSTO of each region and compared it with the theoretical index evaluated from the Padova isochronesGirardi et al. (2002). The age difference between the center and outer region is at least 3 Gyr. We picked the MS stars in the region between the isochrones of 7.9 to 14.1 Gyr with Z=0.0004 in the CMDs and made the spatial isodensity contours. The younger stars are more spatially concentrated than older ones (Figure 1, bottom right).

2. Are Dwarf Spheroidals the Building Blocks of the Galaxy?

The [α/Fe] ratio of stars so far observed in the dSphs are systematically lower than galactic halo stars of similar metallicity Shetrone et al. (2001). This implies that the

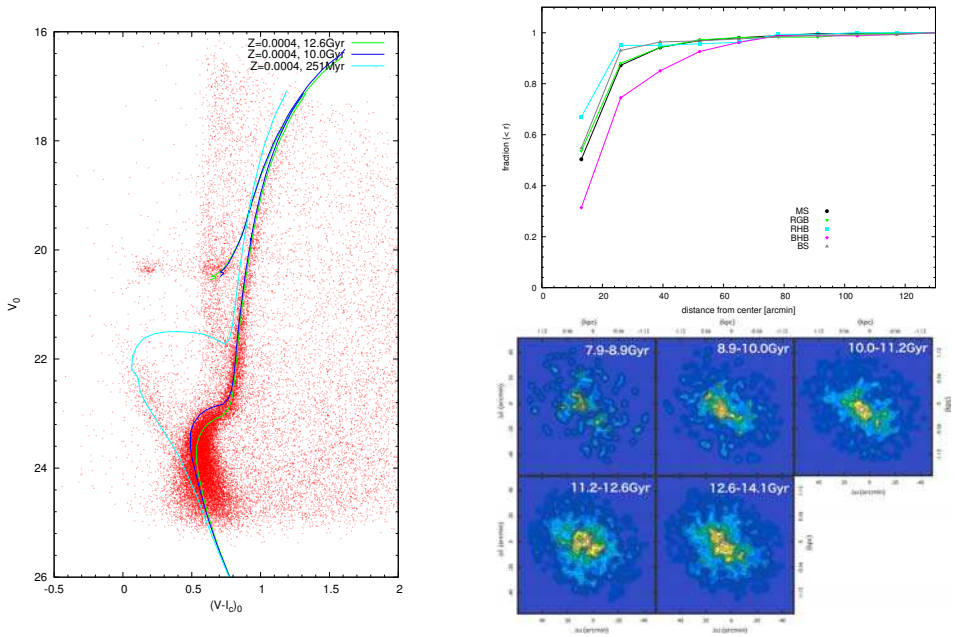

Figure 1. *Left*: CMD of central region (R<40'=1kpc) of the Sextans dSph. *Right top*: Radial profiles of the CMD-selected sources. *Right bottom*: The spatial distribution of different stellar age populations divided by the isochrones of fixed metallicity.

present-day dSphs are not the building blocks of the Milky Way Galaxy Venn et al. (2004). This work shows the star formation in the central region of the Sextans dSph continued at least 3 Gyr, which is long enough to allow for the onset of early Type Ia SNe. Taking into consideration this result, the fossil building blocks of the galaxy had been captured before the type Ia SNe began to contribute Fe enrichment, whereas the present-day dSphs continued their star formation for a few Gyr in the centers of the galaxies. Their [α/Fe] was influenced by the SNe Ia, so that the stellar populations of today are no longer theose formed in the building blocks at the earlier epoch.

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